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ABSTRACT

This document is the 1971-72 annual progress report of the Center to Improve Learning and Instruction, at the University of Utah. A comprehensive look at the major projects of the Center during the 1971-72 year, the principal Center publications, project writing activities, activities related to seeking sources of funding, individual consultations, clearinghouse functions, teaching fellows (TF), training responsibilities, sponsorship of workshops, and a brief analysis of the Center's budget sources and expenditures for 1971-72 is provided. (MJM)

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ANNUAL REPORT OF THE CENTER TO IMPROVE LEARNING & INSTRUCTION, 1971-72

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THE CENTER
TO IMPROVE LEARNING
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by
Miriam B. Kapfer and Gabriel M. Della-Piana

THE CENTER
TO IMPROVE LEARNING
AND INSTRUCTION

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PART I

OVERVIEW OF THE PHILOSOPHY AND FOCUS OF CENTER WORK DURING 1971-72

The Center has just completed its second year of operation. Its central mission since its inception has involved developing and disseminating information that would result in more productive instruction and more meaningful learning at the University of Utah. While this major thrust has remained constant since the beginning, the means for carrying it out have shifted slightly over the two years.

During the first year, a considerable number and variety of instructional improvement activities, research projects, and course development efforts on campus received the support of the Center, in terms both of staff time and monetary grants of varying amounts. By contrast, during the year just completed the Center, in general, has focused greater attention on fewer areas, thereby making the most of available resources and personnel. At the same time that Center staff members worked toward greater depth in established projects, they also continued their informal consultative assistance with proposal writing and course development in a number of departments on campus.

A comprehensive look at the major projects of the Center during the 1971-72 year, the principal Center publications, project writing activities, activities related to seeking sources of funding, individual consultations, clearinghouse functions, TF training responsibilities, and sponsorship of workshops is provided in subsequent sections of this report. The remainder of the present section will be devoted to a brief look at how we believe a Center such as ours can be most effectively organized and operated in a large (21,000 enrollment) and diversified state university setting, keeping in mind the existing factors of (1) stringent times in higher education and (2) people's natural resistance to change when the objects of change involve their own comfortable behavior patterns. Also included in this report will be a brief analysis of the Center's budget sources and expenditures for 1971-72.

First of all, the basic operational philosophy underlying the activities of the Center has been based on three assumptions--that widely divergent instructional techniques and styles can be used to achieve

identical instructional goals, that "teaching" has occurred only when learning has resulted, and that responsibility for instructional improvement rests ultimately with the individual faculty member. Given these assumptions, it is logical that the Center has avoided the pitfall of attempting to develop and disseminate campus-wide any one single "system" or "answer" to instructional and learning problems on campus. Obviously, because there is no single problem, there is no single answer. Also, based on the above assumptions, it is logical that the Center has focused its instructional development and evaluation activities on both the teacher's product (measurable student learning) and the teacher's process (teaching methods and techniques).

Accordingly, it is our view that the central office staff of a Center like ours should be kept small, and should serve primarily as an exchange point for putting faculty in touch with good procedural models, guides, and consultant help, rather than being the exclusive source of all such help. The Center should serve to remove obstacles to instructional improvement by building management systems which would include at least some of the following service components:

(1) Provide live models and procedural guides for a variety of kinds of instructional evaluation and improvement systems. Incorporated into such models would be the requirement that faculty members specify the events they will complete to improve and evaluate their instruction, as well as the earliest and latest expected completion times.

(2) Provide consultation on the use of such systems.

(3) Within such systems, begin with optional activities, clear contingencies, the possibility of immediate obstacle removement, and contingent rewards so that a number of good models become operative fairly quickly on campus.

(4) Within such systems, include incentives such as salary increases, reduced teaching loads, occasional teaching-free quarters, extra student assistance, supplies, and travel funds to visit other innovative programs.

(5) Seek extra-institutional funds to achieve instructional improvement and assist others in the design of proposals seeking funds.

In addition to the above types of Center (and University) functions and systems, we believe that funding from the University for instructional improvement, if available, should be allocated to the separate departments for assuming TF training fuctions, and for designing instructional evaluation and improvement projects, rather than for building a large and possibly inflexible Center organization. In short, as suggested above, departments could use such funds for developing new incentives and new programs to encourage faculty members to evaluate and improve their instruction. Such

incentives and programs are likely to be somewhat unique to each department, and thus are better developed at the departmental level, with Center assistance where appropriate rather than centralized in a University-wide administrative unit.

The nine "teaching proficiency tests" developed during the 1971-72 year (please see Parts III and IV of this report for developmental details) are examples of types of materials that are readily adaptable and useful in departmental staff training programs. Such materials (1) encourage careful analysis of the instructional-learning process, (2) allow individual instructors to evaluate their own teaching and/or have it evaluated by colleagues, (3) promote openness to change, and (4) allow needed changes to occur in a variety of ways.

In order to carry out essential Center activities and move toward the long-range goals identified above, the Center operated during 1971-72 on a basic budget of $80,000 originating from University deans' funds. In addition, a $10,000 grant from the Institutional Funds Committee supported the TF Invitational Workshop and year-long consulting and workshop programs with teaching fellows from a variety of departments on the topics of teaching proficiency assessment, personalized systems of instruction, and test construction. A grant of $17,500 from the Danforth Foundation permitted four Center staff members to work in depth with four professors and five teaching fellows in the Departments of Philosophy, Music, and Ballet and Modern Dance in an effort to analyze aspects of the teaching process and some of its products in these three areas. A grant of $20,000 from the Office of General Education provided approximately half of the total budget for the Study Systems Project, the remainder being composed of funds from the Center's basic budget. Other major expenditures from the basic budget included salaries for the Center director, editor, and PSI director, and printing and mailing costs for Educational Progress Reports, the chief Center publication. Additional expenditures included modest amounts for outside consultants, faculty and teaching fellow time on selected projects, secretarial and clerical help, equipment, supplies, and limited travel. At the close of the 1971-72 year, approximately $21,000 was carried forward in general and teaching fellow training fund accounts.

It is within the context of the preceding analysis of the Center's 1971-72 budget, as well as the Center's chosen approach to service and change functions at the University, that the remainder of this report and the 1971-72 activities described herein should be considered.

PART II

CENTER PERSONNEL AND ADVISORY BOARD

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PART III

MAJOR PROJECTS

Four related but separate projects provided the focus for Center work during 1971-72. These included the Danforth and Teaching Fellow Projects, both of which concentrated on developing the "teaching proficiency test" as a method of measuring teaching effectiveness and as a means of stimulating instructional change. Other aspects of the Teaching Fellow Project included the provision of training in the preparation of personalized instructional materials and in effective test construction. In the PSI Project (personalized instruction), consultant help was provided to interested professors on campus in utilizing techniques for individualizing, personalizing, and semi-programming large-enrollment, formerly lecture-type courses. The Study Systems Project focused on teaching effective study skills to minority students and academically "high risk" students. Each of these projects will be discussed in greater detail in the following sections.

Danforth Project

During the 1971-72 year, the Center to Improve Learning & Instruction received $17,500 from the Danforth Foundation of St. Louis, Missouri, to fund a project titled "Instructional Technology and Diverse Methods of Instruction." The project was one of only six proposals nationwide that were funded in 1971 under the Danforth Foundation's program of "Challenge Grants" for the improvement of teaching at the undergraduate level.

The project was designed by Dr. Gabriel Della-Piana, Center Director, and was subsequently co-directed by Dr. Della-Piana and Dr. Miriam Kupfer, Center publications director. Project staff members included Dr. David Born, Associate Professor of Psychology; Dr. Howard Sloane, Professor of Educational Psychology; and Roger Croft and John Sesney, Center research assistants.

The project was an attempt to use technology in the improvement of instruction in humanistic areas of the undergraduate curriculum. The humanistic areas were chosen because they are by nature generally difficult to submit to technological approaches, and because professors in the humanistic areas, although typically among the most dedicated to

encouraging meaningful instruction and learning, are probably least likely to welcome quantified assessment and other tools of instructional technology as means of achieving the goal of meaningful instruction.

In order to accomplish this technological development in the humanistic areas, it was essential in the design and conduct of the project to choose and develop carefully a technological model that would bring humanism into technology. In other words, a model was needed that would provide the necessary checks and balances by incorporating into a systematic instructional technology, first, highly significant objectives and, second, variability of teaching-learning methods. In addition, a model was needed that would coincide with the Center's basic operational philosophy--that "teaching" has occurred only when learning has resulted, and that widely divergent instructional techniques and styles can be used to achieve identical instructional goals. The "teaching proficiency test" (TPT) was chosen as the model to be used in the project.

The TPT, variously referred to in the literature as a "teaching performance test" or "minilesson," was initially developed through a series of studies begun at UCLA in 1964 by Popham,[a] McNeil,[aa] and others. The use of the TPT concept at the University of Utah led to two principal alterations in the model. First, rather than emphasizing primarily recall of knowledge, an effort was made to focus on goals that represented a wider range of appropriate objectives from the cognitive and affective domains. These included higher level analytic, problem solving, humanistic, value oriented, and aesthetic skills. Second, where appropriate, unit concepts and objectives were analyzed into two groups--those attainable by student self-study of designated materials and those requiring in-class instruction for student mastery. The self-study objectives might be at the lower levels of the cognitive domain such as knowledge and comprehension skills, while the in-class objectives might include behaviors dependent on prior knowledge and comprehension such as analysis or synthesis. Such a division of objectives and content tended to promote careful teacher preparation or selection of self-study materials, and, based on assumed student pre-class study of these materials, equally careful teacher choice of productive and unique tactics for the in-class portion of the unit.

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[a]Popham, W. James. "Development of a Performance Test of Teaching Proficiency." Final report (ED 013 242, BR-5-0566, OEC 6-10-254), University of California, Los Angeles, August, 1967.

____. "Performance Tests of Teaching Proficiency: Rational, Development, and Validation," American Educational Research Journal, VIII (January 1971), 105-117.

____. "Teaching Skill Under Scrutiny," Phi Delta Kappan, LII (June 1971), 599-602.

[aa]McNeil, John D. "Performance Tests: Assessing Teachers of Reading." Paper presented at the annual meeting of the California Educational Research Association, San Diego, California, April 1971.

____. "Performance Tests: A Proposal," The Reading Teacher, XXV (April 1972), 622, 624-627.

What Comprises a Teaching Proficiency Test?

It is important to note, first, that a teaching proficiency test is not an instructional "system." It is a "test" of teaching proficiency. The test model is an actual teaching venture in which the instructor teaches a group of students and the instructor is evaluated in terms of his effectiveness in getting students to master the objectives of the instructional unit. The instructional unit, as designed at the University of Utah, requires from perhaps one-half hour to two hours of in-class teaching time plus a somewhat similar amount of pre-instructional out-of-class study time. It can be designed for students ranging from the elementary level through the college level. Its basic components include (1) a description of the intended learners; (2) concise unit objective(s) clearly specified in terms of measurable student behaviors; (3) a description of the test instrument(s), that will be used to measure student mastery of the designated content, usually with one or more sample test items; (4) the content of the unit itself, either complete, in summary form, or in the form of citations of published materials; (5) the pretest for the unit (unless the unit content is sufficiently unique that no student knowledge of unit content can be safely assumed); (6) the posttest for the unit; and (7) appropriate test scoring keys.

How Can the Teaching Proficiency Test Be Used?

The TPT, first of all, can be used to measure the teacher's ability to bring about desirable changes in learners (such as increased skills, greater knowledge, and improved ability to apply knowledge). The use of the TPT as a method of measuring a teacher's effectiveness, as compared to more traditional methods such as ratings or observations, is based on the assumption that the teaching product (altered behavior in students) is probably a more useful single index of teaching proficiency than is evaluation based only on the teaching process. In using the TPT as a measurement device, the teacher utilizes the unit objectives and content, together with an example of the way in which achievement of the objectives will be measured, to plan a lesson that he feels will best promote student achievement of the objectives. One or more days in advance of in-class instruction, the students are given pre-instruction readings covering some or all of the content of the unit. The students are then given the pretest. (If no pre-instruction study is required and if the content of the unit can be assumed to be totally unfamiliar to the learners, the pretest step may be omitted.) The teacher then instructs the learners for a specified time period, following which the posttest is administered. The pretest (if used) and posttest are similarly designed and both are closely congruent with the objectives of the unit, but neither are seen by the teacher prior to administration. The degree of student mastery on the posttest is taken as an indication of the teacher's ability to teach for prespecified instructional objectives--one very important index of a teacher's instructional proficiency.

Secondly, the TPT can be used for analyzing the processes of teaching and learning. The teacher, who has cooperatively developed a TPT or who has used one developed by another teacher, is typically well-motivated to look at unit results with an eye to determining possible changes in his instructional materials, formulation of objectives, teaching techniques, evaluation methods, the prerequisite skills of his students, or the relationship between any two or more of these. In short, the TPT provides a microcosm of the instructional process that is a viable way of looking at the successes, problems, and challenges within that process. For this reason, varied applications of the TPT as an in-service or pre-service training device in departments, or within larger or smaller administrative groupings, can be of particular value.

Thirdly, the TPT can be used to determine experimentally the contributions to student learning effected by instructional materials and specific teacher behaviors. For example, a comparison of (1) student performance with a live instructor and (2) student performance in self-study without the instructor assists in identifying objectives students can attain with instructional materia' alone. Also, experimental manipulation of specific teacher behaviors intended to foster interest in the subject or to promote higher level analytic skills can help in isolating teaching strategies that are most effective for a particular teacher or a particular instructional goal.

What Are the Limitations of the Teaching Proficiency Test?

The TPT does not assess the full range of teaching proficiency. For example, the long term effects of an instructor on students are not assessed, nor is instruction in larger units or total courses or programs. Informal teaching in conferences, laboratories, and practicums is not assessed. Student on-the-job performance and complicated student products are not assessed. Instead, the TPT is a way for an instructor to look at some limited dimensions of his own teaching performance in terms of process and effect on student learning.

Project Goals

The primary goals of the project were (1) to train participants to develop one TPT, containing humanistic objectives and higher level cognitive skills, for each academic area represented, (2) to collect data on the performance of students on mastery tests for the various instructors, and (3) to develop a model for involving anti-technologically oriented instructors in the technology of instruction.

Project Procedures

Four faculty members and the five teaching fellows (TFs) assisting in their courses were selected to participate in the project. The first round in the process of selecting faculty members and curricular areas for the project was based on a recent campus survey of exemplary teaching practices. Subsequently, the following selection criteria were used: (1) each course provided an opportunity to use technology in a humanistic curriculum area, (2) the courses were taught to relatively large sections each academic quarter, (3) the faculty members and TFs were willing and able to participate in a formal six-hour training program on the development of TPTs conducted by Center staff members, (4) the faculty and TFs were willing to undergo observation and assessment, and (5) the faculty and TFs were willing to accommodate their teaching schedules in the experimental classes to the research and development requirements of the project. Regarding the latter point, they had to be willing, in particular, to give ample time to TPT development and revision, both before and during the various TPT try-outs within each class.

After receiving detailed information concerning the procedures and expected outcomes of the project, professors and TFs in the areas of music appreciation, political philosophy, informal logic, and modern dance were selected and agreed to participate. Subsequently, a series of three two-hour workshops were conducted, focusing on techniques for objective writing, examination of various testing models, detailed explication of the teaching proficiency model, a case study approach to analyzing and using the model, and structured try-outs by participants in preparing instructional units using the model. After the workshops, informal consultative assistance was provided by Center staff members during the course of the project, as project activities, materials, and results provided the impetus for such assistance.

At the close of the project, TPTs in music appreciation and political philosophy were published as issues of the Center's occasional publication, Educational Progress Reports.* Selected aspects of these TPTs will be examined in the sections which follow. (Complete analyses of the development of these tests were included in the project's final report, Instructional

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*Monson, Charles H., Jr., and Richard Goldstein. "Analyzing a Philosophical Argument," Educational Progress Reports, No. 11 (June 1972), 1-7.

Welch, Jay E., and Lance Olsen. "Understanding and Accepting One's Own Responses to Music in Terms of Psychic Distance," Educational Progress Reports, No. 14 (June 1972), 1-15.

Technology and Diverse Methods of Instruction,[*] and in the dissertation, "The Development of Teaching Proficiency Tests at the University Level."[**] In addition, detailed reports and instructional materials were prepared in the areas of informal logic and modern dance. The approaches to using technology in instruction that were explored and developed in the latter two areas were included in the project's final report.

A Teaching Proficiency Test in Music Appreciation

The TPT in music was developed within the course Music 101: Introduction to Music. Music 101 is described as a five-hour non-technical course in music appreciation for non-music majors. It is typically taught each quarter in multiple, large-enrollment sections.

The selection of a topic for the TPT in music was considered in light of two major goals identified by the music professor as being of greatest importance, in his view, in Music 101: (1) that the student increase the range of musical objects to which he responds aesthetically, and (2) that the student achieve greater depth (intensity) of enjoyment of the musical objects already within his range of aesthetic response. A number of possible unit topics were discussed as a means of achieving these broad objectives.

In an effort to get at specific content, it was necessary to adopt the position that cognition and the emotions cannot be readily separated in the aesthetic experience. It was also useful to re-examine the focus and procedures of the project. The best tool for the latter purpose proved to be a project-developed document titled "A Strategy for Assessing and Improving Your Own Teaching Proficiency." The most significant portions of this strategy were those dealing with the separation of the self-study student materials from the materials that require "live, in-class" handling. Implications from this single instructional decision are highly significant in the process of developing higher level objectives in both the cognitive and affective domains for the in-class portion of the TPT, for pre- and posttesting, and also for planning the teaching strategy itself. Without clear distinctions on this point, the primary reason for having live instruction in music appreciation would seem to be the motivational value of an instructor's in-class modeling of appropriate aesthetic responses to the art of music--which is surely an obvious but not necessarily sufficient justification for the presence of

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[*]Della-Piana, Gabriel M., and Miriam B. Kapfer. Instructional Technology and Diverse Methods of Instruction: Final Report, Danforth Challenge Grant Project. Salt Lake City, Utah: Center to Improve Learning & Instruction, University of Utah, 1972, pp. 235-299.

[**]Sesney, John Wilton. "The Development of Teaching Proficiency Tests at the University Level." Unpublished Ph.D. dissertation, University of Utah, Salt Lake City, 1972, 243 pp.

the music teacher.

The topic eventually selected for the TPT in music involved the related concepts of psychic distance and romanticism-classicism in the aesthetic experience. An "advance organizer" type of study guide to accompany the self-study materials was developed.

Objectives.--The objectives for the TPT in music were as follows:

(1) For preparatory study:

(a) Given a test consisting of 15 items that cover the separate concepts of 1) the theory of psychic distance and 2) romantic-classical polarity in art, the university freshman-sophomore non-music major will be able to score at least 50% on the test.

(b) Given a choice of five locations (graphic and verbal) on a psychic distance scale, plus a "no response" choice, the student will be able to categorize or position his responses to the aural presentation of 18 musical examples.

The examples will consist of two paired representatives from each of the following nine groups: 1) Wagnerian romanticism, 2) Mozart-Haydn classicism, 3) Beethoven r/c balance, 4) religious anthems, 5) cool jazz, 6) hot jazz, 7) heavy rock, 8) post-Webern non-tonal music, and 9) cool, facile pop music.

Criteria: The student will demonstrate understanding of the theory of psychic distance by using it in this exercise with conviction (a response of some kind to 60% of the examples) and consistency (matched pairs placed in the same art or non-art realm and in the same or adjacent locations in 50% of the cases).

(2) For the in-class lesson:

(a) Given a test consisting of 15 items that cover the related concepts of 1) the theory of psychic distance and 2) romantic-classical polarity in art, the university freshman-sophmore non-music major will be able to score at least 80% on the test.

(b) Given a choice of five locations (graphic and verbal) on the combined r-c/psychic distance continuum, plus a "no response" choice, the student will be able to categorize or position his responses to the aural presentation of 18 musical examples.

As in Objective B for the preparatory study, the examples will consist of two paired representatives from each of the following nine groups: 1) Wagnerian romanticism, 2) Mozart-Haydn classicism, 3) Beethoven r/c balance, 4) religious anthems, 5) cool jazz, 6) hot jazz, 7) heavy rock, 8) post-Webern non-tonal music, and 9) cool, facile pop music.

Criteria: The student will demonstrate his understanding of these related concepts by using them in this exercise with conviction (a response of some kind to 80% of the examples) and consistency (matched pairs placed in the same art or non-art realm and in the same or adjacent locations in 80% of the cases).

(c) Given the total instructional sequence in this unit (preparatory study, in-class instruction, and pre- and posttests), the student 1) will demonstrate on the above posttest exercise that he has increased the range of musical objects to which he responds aesthetically by "expanding" the space between the underdistant and overdistant poles (i.e., more examples placed in the art realm on the posttest than on the pretest), and 2) will be able to discuss and compare his current response and valuing position with his previous position, and to theorize on reasons for possible shifts in his position. (N.B., it should be understood that attainment of this objective is proposed only within the following limited context: that no items of music literature as such are explicated as objects of appreciation in this unit, but rather that the focus of instruction is on increased self-understanding and understanding of the extent of the total realm of art.)

Description of Tests.--The TPT pretest and posttest were identical in format. In terms of content, however, fewer than one-third of the items were the same on both tests.

Both tests contained five multiple choice and true-false items (covering similar but different content) and ten matching items (covering the same content, but in different order). In these items the knowledge, comprehension, and application categories of the cognitive domain were sampled.

In both tests, affective behaviors in the receiving, responding, and valuing categories were measured by asking the student to respond to aural presentations of 18 paired musical examples. Similar musical examples in the same nine musical categories, but presented in different

order by type of music, were used on the pretest and the posttest.

The organization category of the affective domain was utilized only on the posttest by asking the student to discuss, compare, and theorize on possible shifts in his response and valuing position.

Results.--Objectives 1-a and 1-b over the preparatory study materials were achieved at or above the levels indicated. With regard to the in-class portion of the TPT, on Objective 2-a students closely approached the desired level of 80% accuracy by achieving a group mean of 79%. On Objective 2-b, students were, on the average, 78% accurate and 84% consistent, thus closely approximating the desired mastery level of 80%. The objective of student "expansion" of the art realm, as stated in Objective 2-c, was achieved by a small margin--a mean of 13.8 on the posttest as compared to 13.6 on the pretest. Also, almost without exception, students were able to discuss and theorize about their current valuing positions with regard to the realm of art.

Another significant source of "results" that, in effect, summarizes the project in music can be drawn from the music professor's introspective reactions to developing the TPT. He stated:

> In developing this unit, it took some time and reflection to set aside my habitual teaching approach based on the tradition that in a music appreciation class you "sell" music literature. As I made an effort to come up with student-centered rather than teacher-centered objectives, the idea emerged that a valid part of the approach in a music appreciation course consisted of explorations wherein we didn't sell the student any literature at all, but simply helped him to understand himself better and the nature and variety of the reactions he might have toward music.
>
> . . . . . .
>
> As this philosophy was drawn out into lesson and testing details, it became apparent that some essential features of the teaching method would have to be (1) the instructor's neutrality toward the literature, (2) a truly catholic approach to the whole gamut of musical styles in choosing examples for lecture and tests, and (3) refraining from the impulse to teach knowledge about the literature--or even its identification for subsequent recognition. All three of these features are essential to other phases of a good music appreciation course, particularly the instructor's enthusiasm for his own preferences, but in this unit they were set aside in order to help the student relax and accept his own responses.
>
> At the conclusion of this project in teaching proficiency, I am aware of at least two changes in my teaching approach. First, I am impressed with the effectiveness of pre-lecture reading assignments and the freedom from mere information-

conveying it allows the lecturer. I have a new vision that lecture in that sense of the word is not a good teaching method. In its place, I see my role more as a counselor, demonstrator, and friend. Secondly, I respect more the concept that teaching effectiveness is measured by the change between a pretest and a posttest and that my role in the classroom is to bring about this change through the development of student attitudes, understandings, and whatever else there is besides the filling of the student's head with facts.

A Teaching Proficiency Test in Political Philosophy

The TPT in philosophy was developed within an elementary to intermediate level course for undergraduates. The test employed resource materials in the area of political philosophy and was intended to represent some simple skills in philosophical analysis.

Objectives.--The TPT objectives were as follows:

(1) Comprehension

(a) After reading Walzer's "The Obligation to Die for the State," the student will be able to identify a central point of agreement between Hobbes' and Rousseau's political theory (e.g., state of nature, social-contract, nature of the state, nature of and limitations of obligation, doctrine of natural rights, etc.). One hundred percent accuracy is required.

(b) Given a quote on political obligation, the student will be able to correctly indicate whether it reflects the views of Hobbes, Rousseau, and/or Walzer. One hundred percent accuracy is required.

(2) Analysis

(a) Given a series of four statements, the student will be able to identify the logical sequence in Walzer's argument from premises to conclusion. The student will also be able to identify an important unstated assumption implied in the particular sequence of statements he chose. One hundred percent accuracy is required.

(3) Evaluation

(a) Given a recapitulation of the problem that is being considered by Walzer, Hobbes, and Rousseau, the student will be able

to evaluate the respective positions by employing non-trivial, non-fallacious reasons. A score of at least 2 1/2, based on a scale of scoring provided in the test key, is required.

Description of Tests and Sample Test Item.--The pretest and posttest were identical. The first five questions were multiple choice. They were designed to be completed in a total of five minutes and involved the cognitive skills of comprehension and analysis. The final item, Question VI, was a four-part essay question. Focused on the cognitive skill of evaluation, a maximum of ten minutes was allowed for its completion.

Sample item: The sample test question is based upon the following passage:

"Finally, we have shown that each member of the community regains the same freedom which he yielded up to the general will and that the amount of freedom given to the sovereign is only that which is important. But, is it not true, that only the general will can say what freedom is important to it?"

Walzer would agree completely with the above quotation because:

(a) people only form societies for self-preservation.
(b) maximum freedom is the goal of any liberal theory.
(c) the individual is not the best judge of his own obligation.
(d) the sovereign is the wisest man in the state and can best judge what is important.

Results.--Three try-outs of the TPT in philosophy were conducted. A lecture-type teaching approach was used during all try-outs. Based on data indicating inadequate levels of mastery on the first two try-outs, the objectives were revised and selected test items were shortened and clarified following each session. On the third try-out, however, the mean pretest score was relatively high, indicating that students had fairly good command of the reading material simply from their own independent reading. Therefore, there was little real chance on that try-out for significant gain on the posttest.

Several other possible reasons can be offered for the non-achievement of significant posttest gains by students. First, specific questions to guide student study of the assigned TPT content might have been useful, particularly on the early try-outs. Such material might also have provided additional clarification during all lecture sessions. Second, the lectures might have been structured to deal more specifically with the objectives of the lesson. Third, a "live" approach more productive than the large-group lecture format may have been possible (e.g., teacher-led discussion,

small-group student-led discussion, debates, etc.). Fourth, a motivating factor might have been introduced by extending the objectives to include application of the TPT content to current situations involving civil disobedience.

Summary of Project Outcomes

The Danforth Project was a year-long effort by the Center to Improve Learning & Instruction to focus on small specified segments of instruction as a means of improving learning opportunities for students at the University of Utah. The project involved the development of tests that permitted evaluation and improvement of teaching while maintaining the highly diversified styles of teaching and/or instructional models that existed on the campus.

The general goal of the project was to provide faculty members with a model that could be used to assess teaching and student learning within their own departments. In terms of the three specific project goals listed earlier, the following outcomes were achieved:

(1) Nine participants representing humanistic areas of the curriculum were trained using variants of project models and procedures (adapted as required by individual subject matter areas).

(2) Data on the performance of students on mastery tests under conditions of live instruction and self-study were collected. For the most part, these data indicate that instructors do change their approaches in instruction and improve their effectiveness when given feedback on student performance and when required to repeat the instruction with a different but comparable group of students. However, some instructors do not get significant improvement under these conditions for a variety of personal and technological reasons. Also, for some objectives and some instructors, it was demonstrated that what the instructor was attempting to accomplish with live instruction could be accomplished as well or better, or more efficiently, by student self-study.

(3) A model, the teaching proficiency test (TPT), for involving anti-technologically oriented instructors in the technology of instruction was selected and further developed. In addition, a detailed strategy for working with professors using the TPT model was developed. The strategy model, consisting of 12 partially sequential steps, was generally effective. Elaborations of the strategy recommended on the basis of project experience included the following:

(a) The instructional technology staff should be competent in the subject matter and/or sit in on the instruction over

an extended period of time so as to get enough acquaintance with the subject matter to converse substantively with the instructors. Staff subject matter competence breaks down barriers in interpersonal relations and opens communication. The success of this approach was particularly apparent in the music segment of the project.

(b) The instructional technology staff should work to eliminate interfering conditions such as time limitations, competing demands, and other threats. One example will illustrate the problem. Sometimes several revisions of a given TPT are necessary before instruction "works" for all students. This puts time pressure on the instructor ("I can't get it done in that amount of time,") and also arouses fear of failure ("If I rush to get it done, the students may fail again."). The natural response to such conditions is to say, "This is good enough, I can't revise the objectives again," "The students are simply not able to handle this," "This subject matter is different; it can't be handled this way," and so forth. A more productive response would be to set up revisions for another term, and repeat the instruction under non-threatening (small group) conditions.

(c) The instructional technology staff should provide demonstrations of difficult tasks. For example, many instructors do not use class time for uniquely human or "live" instruction. They do not separate out that which a student can learn on his own with clear guidance and well-prepared materials from that which requires live instruction. In such cases, the most workable alternative may be to engage in a friendly challenge to program for student self-study some of the TPT material. Then a comparison can be made of the relative mastery levels of a "live instruction group" of students with a "self-study group."

Teaching Fellows Project

The training of teaching fellows (TFs) at the University of Utah has historically maintained significant priority among the various in-service education concerns of the University administration. This concern has been manifested in a number of different types of TF training programs on campus. For example, in 1970-71 the basic format of the University-wide TF training program was that of a week-long workshop just prior to the opening of Autumn Quarter. Approximately two to four sessions per day were scheduled on topics considered by central administration planners to be of interest and value to TFs. Topics included microteaching, behavioral objectives, the informal counseling functions of TFs, test construction techniques, and additional topics and speakers of motivational value. TF participation

in the workshop was, in general, "required" by the respective departments on campus. In fact, however, attendance figures fluctuated from session to session during the week.

TF reactions to the training program, measured by an end-of-workshop evaluation form, varied for several reasons. While some TFs were experienced teachers, others had not taught previously at the university level and some lacked teaching experience at any instructional level. Therefore, their perceptions of their training needs and of the potential benefits of workshop sessions differed widely.

Another important factor affecting the success of the program involved the schedule adopted, that is, the plan of conducting the training program in one time block prior to the beginning of Autumn Quarter sessions. This schedule had the obvious advantage of utilizing a time period of relative freedom for TFs, but it also carried the associated disadvantage of operating in the vacuum of hypothetical educational problems. Instead of utilizing the difficulties of real day-to-day student encounters and newly-realized gaps in teaching skills as the basis for building and conducting the training program, TFs were more or less asked to "get interested" in teaching-learning phenomena for which many had little in terms of an experience base, for which they were given few options of choice, and for which there was no element of immediacy in time.

Also, the format and time constraints of the program necessitated the imparting of information verbally in large group lecture-type settings, with less than optimum opportunity for small group discussion, for behavioral "try-outs" of new skills, for consideration of content-specific problems within the various departments or disciplines, or for on-going TF feedback and evaluation during the workshop program itself. Additionally, because University resources were focused on the week-long workshop itself, no provisions were made for post-workshop consultation with individual TF participants or for follow-up procedures to evaluate the long-range effectiveness of the training program.

Planning for 1971-72

In 1971, Dr. Gabriel Della-Piana, Director of the Center to Improve Learning & Instruction, was asked to assume responsibility for planning and conducting the 1971-72 TF Training Program. Planning decisions about the program were based on several factors including, of course, the considerations outlined above. Additionally, several types of data from other related Center projects had a strong influence on the final shape of the 1971-72 training program.

For example, information from a questionnaire, "Inventory of Instructional Problems and Student Performance Deficiencies," which was sent to TFs in November 1970, indicated a number of areas on which future TF workshops might focus. TFs were asked to check the deficiencies most characteristic

of students in their classes. The questionnaire results pointed up three types of concerns--motivational problems (students do not complete assignments or perform tasks as they should, even though the tasks are not extremely difficult; students could perform assigned tasks adequately if their lives depended on it, but they typically do not do the necessary work; etc.), management problems (many students could move more rapidly through given courses and, as a result of the slower pace, they experience boredom; if a faster pace is taken, many students fall behind and perform poorly; etc.), and instructional problems (the content of textual material is not adequate, i.e., it contains errors or major omissions or is illogically presented and unnecessarily difficult; students may master the text material but they do not use the material in analyzing or solving new problems not in the text; etc.).

During Spring Quarter 1971, an informal Center workshop conducted with twelve TFs from eight departments provided additional information on potentially productive focuses for future large-scale TF training efforts. The TFs met for nine sessions and reviewed many ideas and techniques related to behavioral "try-outs," time-task management, goal setting, testing methods, and feedback mechanisms. Although the workshop was productive, it provided only a sample of what might be done over a longer period of time with more systematic and in-depth approaches.

Based on the above information, it appeared that a significant need existed for a year-long, well-controlled, high quality, voluntary program to assist interested TFs in the improvement of instruction and learning. Therefore, the staff of the Center submitted a proposal to the University of Utah Institutional Funds Committee in July 1971 requesting $10,000 to assist in the TF training program. The funds were approved for use as TF honoraria and, with additional Center funds of $17,350 for conducting the program, the project was planned as follows.

A Three-Phased Voluntary Program

In outline form, the TF training program consisted of the following three phases: (1) an Autumn Quarter invitational orientation session for TFs and faculty on the topics of teaching proficiency assessment, personalized instruction, and test construction; (2) TF-initiated informal or occasional follow-up consultation sessions during the year with Center staff members on the three topics just listed; and (3) TF instructional improvement activities related to the three identified topics, carried out during the remainder of the academic year according to performance contracts with the Center.

Phase 1, the TF Invitational Workshop, was conducted on Saturday morning, November 20, 1971. TFs in all University departments were invited. More than 100 TFs participated, although attendance was placed on a voluntary basis by the large majority of departments. The workshop was designed as a "stepping-off point" for participants rather than as a self-contained activity. Thus, the program consisted of three one-hour introductory

sessions on the three topics listed above. The sessions utilized multi-media approaches, a variety of large group speakers, informal discussion, and question and answer sessions. In addition, packets of materials on each of the three topics were distributed and discussed.

At the close of the workshop, TFs were told that they could work in any one of the three areas presented and at one of three phases of participation, according to their interests, needs, and time schedules. They were asked to indicate first and second choices for topics and phases of work, and were also reminded of the commitments involved in each phase. In the first phase of participation, the TF would try, on an entirely independent basis, one or more of the three instructional improvement strategies presented at the Invitational Workshop, relying solely on the workshop presentations and on the information contained in the three workshop packets. In the second phase of participation, the TF could try any one of the strategies on his own, but with the option of getting consultant help from the Center staff whenever desired. It was pointed out that the materials in the packets were selected or developed with the participants in Phase 1 and 2 in mind in particular. In other words, it was the Center's objective to provide TFs on the day of the workshop with clear, concise packages of materials on three topics of interest that would allow them to experiment with the techniques in whatever ways best suited their individual teaching situations. In Phase 3 of participation, the TF could select the option of doing developmental work related to one of the three workshop topics on an in-depth, honorarium basis that would continue during the remainder of the academic year. Honoraria amounts were projected to be in the range of $250 to $350 per TF, depending on the types of TF commitments made to the project and on the quality of work done.

On the close-of-workshop response form, nearly 90% of those attending rated the total workshop at "4" or "5" on a five-point scale, ranging from "really poor" (rating of 1) to "great" (rating of 5). The response form also yielded the following results in terms of anticipated 1971-72 participation. Of the more than 100 TFs who attended, 42 elected to use on their own the workshop materials presented (Phase 1), 37 indicated a wish to try out the materials independently and obtain Center assistance as needed (Phase 2), and 27 requested the option of participating in the Center's program of year-long consultation and production in the three designated areas (Phase 3).

Project resources did not permit a follow-up study of Phase 1 participants. Follow-up of the 37 TFs who elected to operate within Phase 2 of the project revealed that very few in fact actually contacted the Center for additional assistance. The needs of those who did centered on minor clarification or procedural problems that could be handled with a minimum of Center staff time. The remainder of this report will, therefore, deal with Phase 3 activities.

Of the 27 TFs who indicated a desire to participate in Phase 3, natural attrition due to employment changes, the priorities of studying for

prelims or conducting dissertation research, heavier-than-anticipated teaching loads, and related concerns caused the final number of Phase 3 participants to stabilize at 21. Of these, eight were employed on performance contracts with the Center in the area of teaching proficiency assessment, eight worked in the area of personalized instruction, and five worked on test construction. It should be noted that five other University staff members also participated in selected phases of the test construction component, but because of substantially different needs, they did not complete the total program. Because the training and consultation techniques varied among the three areas, the procedures and products of each will be discussed separately below.

Teaching Proficiency Assessment

The teaching proficiency assessment component of the Teaching Fellows Project was co-directed by Dr. Gabriel Della-Piana, Professor of Educational Psychology, and Dr. Miriam Kapfer, Center publications director. Project staff members were Roger Croft and John Sesney, Center research assistants.

Teaching proficiency assessment is a newly developing technique for enabling a teacher to assess some parameters of his own instructional performance and for analyzing the instructional-learning process. It rests on the assumption that student performance after instruction is at least one significant index of the effectiveness of that instruction. A detailed description of the teaching proficiency model was included in the preceding section of this report in which the Danforth Project was discussed.

The objectives of the teaching proficiency component of the TF project were to train participants (1) to design and develop a small unit of instructional material based on the teaching proficiency model (containing objectives, resource materials, pre- and posttests, scoring keys, etc.), and (2) to subsequently disseminate each unit by asking another member of the appropriate department to teach the unit, analyze the student achievement data collected, pinpoint possible reasons for lack (if any) of student mastery,* and take whatever remedial measures in the teaching-learning process that seem to be required in order to secure student mastery of unit content.

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*Among the questions that might be asked in analyzing non-mastery performance in students are the following: (1) Are the objectives clear? (2) Is the content related to the objectives? (3) Are the test items congruent with the objectives? (4) Are the test items well written? (5) Do the students have the necessary prerequisite (entering) skills? (6) Is the sample of students who used the unit representative of the class as a whole? (7) Were effective teaching techniques used? (8) Are the pre-instructional materials clear and applicable?

In meeting these objectives, a series of three two-hour weekly training workshops was held during Winter Quarter 1972 to enable TFs to acquire the skills and behaviors required for developing and using teaching proficiency tests. The first workshop session included orientation to the teaching proficiency model, an introduction to the Taxonomy of Educational Objectives,* and practice materials on writing behavioral objectives. The second workshop was devoted to working through a fictitious case study of the results of the teaching proficiency approach and to a discussion of test models and testing techniques. The third workshop consisted of actual production activities in the areas of teaching proficiency unit content, objectives, and test items.

Following the workshop series, Center staff members met on an individual or TF team basis with participants as they worked through the steps of (1) completing first drafts of the teaching proficiency units, (2) trying out the units with small groups of students, (3) analyzing the student test results, (4) making changes in the units or the teaching techniques as required, (5) reteaching new groups of students until mastery was achieved, and (6) securing other TFs or faculty members to teach the units on an experimental basis for dissemination purposes.

TFs selected for the teaching proficiency component were required by the design of the teaching proficiency model itself to work in teams according to teaching fields.** Eight TFs in the fields of English, Spanish, physics, and mathematics produced a total of seven teaching proficiency units. Two units each were completed in each field except mathematics, in which case a single unit plus the unit content in programmed form were produced. All of the units were published as issues of the Center's

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*Bloom, Benjamin S., et al. Taxonomy of Educational Objectives, Handbook I, Cognitive Domain. New York: David McKay Co., 1956.
Krathwohl, David R., Benjamin S. Bloom, and Bertram B. Masia. Taxonomy of Educational Objectives, Handbook II, Affective Domain. New York: David McKay Co., 1964.

**This was necessitated because each TF prepared the tests and test keys for his teammate's teaching proficiency unit, so that when the units were taught successfully, the accusation could not be made of having "taught for the test." Therefore, following each teaching of the unit, test scoring was completed by the member of the team not having done the teaching.

occasional publication, Educational Progress Reports.* The work leading to the development of teaching proficiency units in each academic area is discussed briefly below.

English.--The teaching proficiency unit, "Identifying Themes and Poetic Devices in Selected Poems," was designed for University of Utah freshmen and sophomores in English 250 (Introduction to Literature), a course designed for students not majoring or minoring in English. The unit was based on a textual analysis of "Ulysses" and "Soliloquy of the Spanish Cloister." Knowledge and comprehension behaviors in the cognitive domain of the Taxonomy of Educational Objectives were represented on the two-part posttest over the unit.

The unit, "Identifying and Using Four Types of Speaking and Writing," as designed for university freshmen in a "Guided Studies" section of English 101 (Written Composition). The Guided Studies students for which this unit was developed scored below average on the entering placement test in English. The unit was based on the distinguishing characteristics of dialogue, direct address, summary, and evaluation as types of speaking and writing. In terms of the cognitive domain of the Taxonomy, the test over the unit was composed of five multiple choice items at the knowledge level, six matching items at the knowledge and analysis levels, and three "conversion" items that focused primarily on comprehension (translation) and synthesis behaviors (assuming that the "conversion" items were not taught for directly during the in-class instruction).

Spanish.--The unit, "Conjugating and Using Future Tense Verbs in Spanish," was prepared for university students enrolled in the Spanish 101-102-103 sequence (First Year Spanish). The unit was used during the second and/or third quarter of the course, depending on how individual class sections were handled. Unit content consisted of the future tense

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*Bennett, Sandra. "Identifying Themes and Poetic Devices in Selected Poems," Educational Progress Reports, No. 6 (June 1972), 1-8.
Crocker, Margaret M. "Identifying and Using Four Types of Speaking and Writing," Educational Progress Reports, No. 7 (June 1972), 1-7.
Knudsen, Peter Lee. "Conjugating and Using Future Tense Verbs in Spanish," Educational Progress Reports, No. 9 (June 1972), 1-10.
Staley, Grant. "Identifying and Using the Present Subjunctive in Spanish," Educational Progress Reports, No. 13 (June 1972), 1-11.
Jaloszynski, John E. "The Analysis of Errors," Educational Progress Reports, No. 8 (June 1972), 1-12.
Smoech, Nickolaus. "Elementary Model of Some Electric and Magnetic Properties of Matter," Educational Progress Reports, No. 12 (June 1972), 1-7.
Kratz, Larry, and Steven Parker. "Using an Expedient Method of Multiplication," Educational Progress Reports, No. 10 (June 1972), 1-9.

of (1) regular -ar, -er, and -ir verbs and (2) three classes of irregular verbs. The unit pretest and posttest each required knowledge, comprehension, and application behaviors in the cognitive domain of the Taxonomy.

The second Spanish unit, "Identifying and Using the Present Subjunctive in Spanish," was planned for university students enrolled in first quarter Spanish, after having had five to six weeks exposure to the Spanish language. Unit content covered the present subjunctive of (1) regular -ar, -er, and -ir verbs and (2) three categories of irregular verbs. The pretest and posttest each consisted of three sections representing knowledge, comprehension, and application skills.

Physics.--The "Analysis of Errors" unit was planned for university sophomores or juniors enrolled in the Physics 111 or 171 series, particularly the Physics 161 or 180 series laboratories. The intended majors of students in these courses included all fields of science, mathematics, premedical, predental, pharmacy, and related fields. The content included the related concepts of error, discrepancy, random error, and systematic error. In terms of the Taxonomy, the pretest was designed to measure knowledge of the pre-class reading material as well as knowledge, comprehension, and application behaviors related to the in-class instruction segment. The posttest measured knowledge, comprehension, and application behaviors from the in-class portion of instruction only.

The unit "Elementary Model of Some Electric and Magnetic Properties of Matter" was designed for university students enrolled in Physics 182 (Physics Laboratory for Scientists and Engineers). The unit content included the natural phenomena of (1) the behavior of conductors and dielectrics under applied external electric fields, (2) the effect of external magnetic fields on matter, (3) the influence of temperature on certain species of matter that are under the influence of external fields, (4) the temperature dependence of magnetization, and (5) the temperature dependence of surface charge density on dielectrics and polarization. The pretest and posttest were similar in format, except that the pretest had two additional multiple choice items designed to test students' knowledge of the pre-lecture reading material. Both tests contained four items covering the lecture material. Of the latter group, one item on each test was a knowledge item and the remainder were comprehension items.

Mathematics.--The unit "Using an Expedient Method of Multiplication" was designed for university freshmen enrolled in introductory mathematics courses. The content of the unit consisted of an alternative to the traditional method of multiplication, the initial use of which would be expected to result in loss of speed and accuracy of multiplication skill, but with continued use would be expected to result in substantially increased speed and accuracy. The pretest and posttest were identical

in format but different in content. In terms of the Taxonomy, cognitive behaviors at the level of application were involved in both tests.

Summary.--Following the development of the teaching proficiency units in the content areas indicated above, the units were tried out from two to four times (average of 2.9 trials) with various groups of learners until acceptable levels of student mastery were achieved. During the try-out process, TF participants were able to identify discrepancies in objectives, test items, or other aspects of instruction that prohibited students from achieving mastery of the instructional objectives. TFs used this information to revise their units and teaching procedures in several ways, but in particular so that (1) they made maximum use of the students' preparatory study time by providing clear, concise objectives and study materials, and (2) they took maximum advantage of the in-class time by teaching for those learnings that uniquely required live interaction with a teacher. In other words, based on the facts of how their students learned, TFs voluntarily made changes in their teaching approaches that they might have been less willing to make had they not recently acquired and used some basic skills in instructional design and analysis. Finally, based on the experiences of the project, TF participants were equipped to provide assistance to other staff members within their departments who might wish to develop similar instructional units for the purpose of examining their instructional procedures.

Personalized Instruction

The personalized system of instruction (PSI) component of the Teaching Fellows Project was conducted by Dr. David Born, Associate Professor of Psychology, and Michael L. Davis, graduate student in the Department of Psychology.

PSI is a general set of instructional procedures that (1) allows the individual student to proceed through course materials largely at his own rate, with the restriction that he finish by the end of the term, (2) provides the individual student, by means of a staff of "proctors," with nearly immediate and personalized feedback concerning his progress and understanding of course-related materials, (3) requires the student to pass "proficiency" tests over small chunks of course material, and (4) demands high levels of excellence from each student in the program. Data presently available indicate that students trained under the PSI format (1) perform significantly better on comprehensive course examinations than students taught with more traditional procedures, and (2) prefer PSI courses to traditionally taught courses.

TF participants in the personalized instruction component were required to meet the following criteria before joining the training program: (1) freedom to plan and teach a one-quarter course Winter and/or Spring

Quarters during the 1971-72 academic year, (2) availability of departmental permission to participate in the PSI program and to use innovative instructional techniques when teaching assigned courses, (3) access to a cooperating faculty member from each TF's department who would be willing to supervise content selection and provide feedback concerning the course plan and implementation, and (4) sufficient time for the considerable effort involved in planning a PSI course.

Following are the general objectives of the PSI component of the Teaching Fellows Project:

(1) To acquaint the TF trainees with the philosophy, history, and technology associated with PSI procedures.

(2) To assist each participant in planning a one-quarter course using PSI procedures.

(3) To provide consultation and assistance to each participant in "teaching" a PSI course at least one quarter.

(4) To provide evaluation techniques for the PSI courses developed and managed by trainees.

Two orientation workshops for participants were held during Winter Quarter 1972. Training materials were based largely on Born's Instructor Manual for Development of a Personalized Instruction Course* and Proctor Manual.** (The development of these manuals was made possible mainly by support from the Center to Improve Learning & Instruction, University of Utah.) Subsequently, consultation with TF participants was conducted on an individual basis as feedback was required or requested.

By the end of Spring Quarter 1972, the products of the training program consisted of the following materials from seven of the eight participants: (1) brief descriptions of the courses that were converted to PSI procedures, (2) questionnaire evaluations of the courses by students, and (3) samples of course materials developed in connection with the project. The eighth trainee participated only in the inital phases of the training program. In two cases, participants worked in teams in converting courses to the PSI approach.

The courses in which PSI materials and procedures were developed were the following: (1) English 101: Remedial Composition, (2) English 106: English Composition for Foreign Language Students, (3) Political Science 110: American National Government, (4) History 102: History of European Civilization, (5) Sociology 101: Introduction to Sociology, and (6) Sociology 102: Current Social Problems in America. The project work completed on each course and evaluations of it are discussed briefly on the following pages.

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*Salt Lake City, Utah: Privately printed, 1970, 165 pp.

**Salt Lake City, Utah: Privately printed, 1970, 44 pp.

English 101: Remedial Composition.--PSI units were developed on the topics of "The Coherent Paragraph," "Chronological Development," and "Analytical Development" (cause and effect, definition and example, comparison and contrast, and structure and style). On a three-point rating scale ("very helpful," "helpful," and "not helpful"), the unit mastery tests were rated as "very helpful" by three out of 16 students and as "helpful" by the remaining 13 students. Course writing assignments were rated as "very helpful" by nine students and as "helpful" by the remaining seven students. The course personnel (instructor and proctors) were rated as "very helpful" by 11 students and as "helpful" by the remaining five students. Three students rated the unit on dictation as "not helpful" and two students rated the lecture summaries as "not helpful." However, the majority of students rated both topics as "helpful," with three and four respectively supplying ratings of "very helpful." Most students said that they had "learned a lot," but that they needed more verbal explanation from the instructor on selected sections of the PSI study units.

English 106: English Composition for Foreign Language Students.--PSI units were developed on general methods of composition as well as on structure and mechanics. A total of nine students supplied evaluations on the study guides, tests, writing assignments, and teaching personnel. Sub-topics were evaluated in each category also. Highest ratings were received in the personnel category. A total of 66 ratings of "very helpful," 36 ratings of "helpful," and five ratings of "not helpful" were received. Additional comments revealed a range of student reaction and included the following: "I liked the help that the proctors gave us," "We needed more time," and "I should like to have more lecture from the instructor."

Political Science 110: American National Government.--Fourteen PSI units on American government were developed, two of which (Nos. 7 and 14) were review units. A majority of the 14 students in the course felt that the amount of required reading material in the PSI system was excessive, that there were too many tests, and that fewer and larger study units would have been preferable. At the same time, however, all students felt that the course was much more interesting than other courses taken at the University. On a seven-point scale of comparison with other courses, all students rated the course at five or above, with the majority of ratings in the six or seven range. Comments included the following: "It's the best class I ever had, but it was hard," "The instant analysis of my tests helped me better understand the material," and "I feel I have retained considerably more knowledge than in other classes taught in the traditional method."

History 102: History of European Civilization.--Study materials and examinations for eight PSI units were developed and used. However,

one of the essential ingredients of the PSI system, the use of proctors, could not be incorporated into the procedures of History 102 because of scheduling problems. Even so, the student course evaluation indicated that students enjoyed the use of PSI study guides and examinations, that the course was "more work" but that it resulted in greater learning and retention without the need for last-minute cramming, and that the PSI approach allowed greater focus on important issues and events.

Sociology 101: Introduction to Sociology.--The course content was converted into ten PSI units. Students were "generally favorable" to "highly enthusiastic" about the PSI approach, the instructor, and the proctor staff. On a detailed course evaluation form, students rated the interest value of the course at 5.6 on a seven-point scale (1 being "least interesting" and 7 being "most interesting") when comparing it to other courses at the University. When making the same comparison on the factor of learning, they rated the course at 5.8. Proctors were rated at an average of 6.3 on seven-point scales having to do with degree of helpfulness, ability to elicit independent thinking, fairness in grading, and knowledge of course material. Thirty of the 34 students surveyed said they would recommend the course positively to other students.

Sociology 102: Current Social Problems in America.--Eleven PSI study units and one review unit were developed for Sociology 102. Of the 51 students who completed the course, 11 characterized themselves as "very positive" about the approaches used in the course, 23 were "positive," three were "neutral," four made no comment, five said they were "negative," none used the category of "very negative," and five made suggestions for course improvements without characterizing their own particular feelings. Among specific comments were the following: "Don't change it," "Good retention," "A lot of work," "Spoon-fed and dull," and "I liked the 'own-speed' system."

Summary.--Participants in the personalized instruction component of the Teaching Fellows Project demonstrated mastery of the procedures involved in setting up a PSI course by writing sets of PSI materials for one-quarter courses they regularly teach, by developing the necessary organizational systems, by obtaining and training the essential personnel (except in one case), and by implementing the courses using the materials and instructional systems developed.

Test Construction

The test construction component of the Teaching Fellows Project was conducted by Dr. Robert Steffensen, special consultant to the Center,

and Brent Page, graduate student in the Department of Special Education.

The general purpose of the test construction segment of the Project was to provide assistance to interested University teaching fellows in improving their tests and testing skills. Specifically, the three objectives of the test construction training component are listed below, each followed by a set of strategy steps designed to clarify the objectives and outline the means for their achievement:

(1) To assist participants in conducting needs assessments of testing according to each individual participant's teaching assignment.

Strategy:
- (a) Determine present testing status.
  - 1) Harvest testing concerns.
  - 2) Validate testing concerns.
- (b) Define testing needs.
  - 1) Analyze testing status.
  - 2) List testing priorities.
- (c) Formulate testing objectives.
  - 1) Determine testing performance requirements.

(2) To assist participants in the construction of testing instruments according to the test construction principles developed by the Educational Testing Service.*

Strategy:
- (a) Select appropriate test form.
  - 1) Examine test variables.
- (b) Plan the test.
  - 1) Identify test topics.
  - 2) Indicate number of items per topic.
  - 3) Collect materials.
- (c) Write test items.
- (d) Prepare test for administration.

(3) To assist participants in the use of computer programs designed to facilitate the scoring and analysis of their tests.

Strategy:
- (a) Score the test.
  - 1) Criterion-referenced scoring.
    - a) Interpret performance by criterion.
    - b) Determine areas of proficiency or deficiency.
    - c) Report results.
  - 2) Norm-referenced scoring.
    - a) Order scores from high to low.

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*"Making Your Own Tests." Princeton, New Jersey: Cooperative Test Division, Educational Testing Service, undated. 28 pp.

b) Relate scores to group.
c) Relate scores to grades.
d) Report results.

(b) Analyze the test.
1) Determine index of difficulty.
2) Determine index of discrimination.
3) Record analyses.
4) Re-use as necessary.

The participants were scheduled individually to work toward each objective, based on a consultation-type approach. The training materials used during consultations included the test construction packet* distributed at the Invitational TF Workshop, a test model alternatives worksheet,** and information on the FORTAP program of computer test scoring and analysis.*** The frequency of consultations ranged from two times per week to two times per month, according to the testing needs and time commitments of each individual participant. For the most part, the actual work (determining the test model, selecting the format, writing the items, etc.) was done by the participants, following which it was critiqued and revised by the project consultants. Occasionally, however, the consultants wrote items in areas in which they had sufficient familiarity with the subject matter.

When applicable, the University of Utah Computer Center facilities were used to score and analyze the tests, using the FORTAP program. The types of information provided from the FORTAP program included (1) a reliability coefficient (Kuder-Richardson #20), (2) summary statistics (mean, standard deviation, and standard error), (3) a list of all scores, (4) an item analysis (number of students choosing each alternative, index of difficulty, and index of discrimination), and (5) a testee roster.

Additionally, some simple hand-calculated item analyses were attempted. Also some indices of difficulty and discrimination were calculated by hand, as well as test-retest reliability coefficients and scoring reliabilities.

Five participants representing the Departments of Home Economics, Speech, Languages, and Community and Family Medicine (two participants) met the objectives of the training program in their entirety. Five other staff members whose responsibilities were primarily administrative rather than instructional, and therefore not within the basic focus of the project, also participated in selected aspects of the program. Products of the

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*"Test Analysis and Test Construction Packet: Teaching Fellows Workshop." Salt Lake City, Utah: Center to Improve Learning & Instruction, University of Utah, 1971.

**"Mastery Model Table." New York: Praxis Corporation, 1970.

***Dewsnup, Merriel. "Instructions for the Test Scoring and Analysis Service at the University of Utah." Salt Lake City, Utah: Computer Center, University of Utah, 1971.

training program included statements of course objectives and the corresponding test instruments in the academic areas just listed. Each area is discussed briefly below.

Home Economics 171: Home Management.--Four objectives for a segment of Home Management were refined, with increased emphasis on behavioral terminology and techniques. The midterm test, which corresponded to the four objectives, was analyzed using the FORTAP computer program for feedback for test revision purposes. Additional analysis and revision of the test instrument was underway at the close of the TF training program.

Speech 101: Fundamentals of Speaking and Listening.--Revision of the final examination for Speech 101 was the focus of work in the Speech Department. After subjecting the final examination from a previous quarter to computer analysis, poor items were discarded or revised and new ones were added. The test was then given to two classes, the results of which were analyzed with the use of the FORTAP program. Reliability was calculated at .85 for one class and only .19 for the other. The vast difference in the two coefficients may be due to the fact that there were only 11 students in the latter class and that the low enrollment resulted from an extremely high withdrawal rate--from approximately 35 students down to the 11 who completed the course.

Spanish 102: First Year Spanish.--Tests involving the skills of translating from English to Spanish that have typically been given in Spanish 102 were analyzed. Reliabilities were found to be between .71 and .80. Subsequently, behavioral objectives were prepared and matched to sub-sections of a new final examination that was based on a more objective testing model. Hand calculations were completed resulting in indices of difficulty and discrimination for the new test. Computer analysis of the new instrument revealed a reliability of .85.

Community and Family Medicine: MEDEX Project.--The MEDEX Project involved the further training of medics from the armed forces, with the ultimate goal of producing paraprofessionals who will be assigned to work under physicians in clinical settings. The major focus of the test construction activities in the MEDEX program was the devising of appropriate testing models for mastery tests that were keyed to detailed lists of MEDEX behavioral objectives. At the close of the Center's training program, additional evaluation and revision of behavioral objectives, evaluation of the instructional process, and test construction, analysis, and revision were occurring.

Summary.--Participants in the test construction component of the Teaching Fellows Project generally had exposure to or experience with the following procedures within their individual teaching areas: (1) computer analysis of a current course examination and/or comparison of it with a

taxonomy to determine areas of gaps in assessment and areas of poor items, (2) rewriting of items to improve the quality and to include a wider variety of intellectual skills, (3) administration of the new test, and (4) use of computer test scoring and analysis of the new test as a basis for validation and further revision.

TF Project Conclusions

A three-phased, individualized training program such as the one described here requires a great deal more in terms of planning and coordination than a "one-shot," large-group workshop on teaching improvement. However, the pay-offs are potentially greater in terms of effecting desirable and lasting changes in the participants' teaching behaviors. The high potential of the individualized consultation approach to in-service education rests on the fact that participants choose the area and depth of training based on their own perceptions of need and they continue in the training program only as long as it remains useful to them to do so. Participants who do complete Phase 3 of the program, therefore, may be expected to be effective proponents within their departments of the specific techniques introduced during the training program, and to continue to use these techniques in their own teaching, both as TFs at the University of Utah and later as full-time faculty members at Utah or elsewhere.

PSI Project

The Personalized System of Instruction (PSI) Project, directed by Dr. David Born with the assistance of graduate student Michael Davis, has resulted during the 1970-71 and 1971-72 years in three research reports, three formal papers including an invitational presentation at MIT, an analysis of student study behavior in PSI and lecture courses (completed Autumn Quarter 1971), an analysis of student study behavior in self-paced and instructor-paced instruction (completed Spring Quarter 1972), and two PSI manuals.* At least thirteen professors on campus are using a variant of the PSI approach. Many of them have read the PSI manuals but others have started on these efforts independently. The major problems in implementing the PSI approach are (1) the considerable initial effort

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*David G. Born. Instructor Manual for Development of a Personalized Instruction Course. Salt Lake City, Utah: Privately printed, 1970. 165 pp.

David G. Born. Proctor Manual. Salt Lake City, Utah: Privately printed, 1970. 44 pp.

required to convert a course to PSI and (2) the difficulty in adopting PSI for only a part of a course.

A major amount of PSI work during 1971-72 was devoted to training TFs in the conversion of conventional courses to PSI approaches. This work was presented in detail in the preceding section. In addition, during 1971-72 PSI approaches were also presented to interested groups of faculty members in the College of Medicine (Pharmacology Department), College of Engineering, and College of Health, Physical Education, and Recreation. More specific PSI developments included the experimental application of PSI procedures to a course in informal logic in the Philosophy Department, the details of which are presented below.

PSI in Informal Logic

Dr. William Whisner, Assistant Professor of Philosophy, and teaching fellow Richard Strickland participated with Dr. Born in an evaluative study of "Alternative Procedures for Teaching Informal Logic." Concerning the study as a whole, Dr. Whisner stated,

> Prior to this course we had no evidence to support the view that the personalized instruction technique (PSI) could be used successfully in a course in informal logic. Our . . . evaluation of the course . . . tends to support the view that the PSI methodology is more effective than traditional methodologies [lecture-discussion] for teaching informal logic.

In the course as typically handled, crucial course material appeared in a combination of text[A] and lectures. In the 1971-72 study, one section of students encountered the material in this format. Students in a second section of the class received the supplemental lecture information in a written form and heard no lectures. In a third section, they had opportunities to hear lectures and they received the written lecture material. Finally, a fourth section of the class went through a version of the personalized system of instruction (PSI) described by Keller (1968)[AA] in which they met with advanced undergraduates during the lecture hours for both a written examination and an interview to determine their deeper understanding of the material contained in the text and written lecture notes. Effectiveness of these alternative procedures were evaluated with an examination designed to assess student understanding of essential material.

[A]Carney, J. D., and Sheer, R. K. Fundamentals of Logic. New York: McGraw-Hill, 1962.

[AA]Keller, F. S. "Goodbye teacher . . ." Journal of Applied Behavior Analysis, 1968, 1, 79-89.

Subjects.--Fifty-three students enrolled in Philosophy 121: Informal Logic at the University of Utah during Winter Quarter 1972 served as subjects.

Procedures.--Each of the 53 students received a package of written materials at the start of the one-week period when the experimental teaching procedures were in effect. This package contained a brief outline of the experimental procedures, a set of instructions (different for each group of students) which detailed the procedures in effect for the next week, and a set of instructional objectives prepared by the instructor to guide students in their preparation and study of course material. In addition, students in three of the four treatment groups received a set of detailed lecture notes which formed the basis for two one-hour lectures delivered by the course instructor at two regular class meetings.

Lecture Only (LO).--The package of materials distributed to the 15 students in the Lecture Only (LO) group contained all information given to the other students except the written lecture notes. Therefore, these students had access to supplementary material only through the lectures delivered by the course instructor. The supplementary notes distributed to other students in the course formed the basis for the two lectures given to students attending lectures. In essence, the procedures in use for the LO group were those typically used by the course instructor.

Written Material Only (WMO).--Included in the materials distributed to the 12 students in the Written Materials Only (WMO) group was a set of instructions informing these students that although they were not to come to class until the following Friday, when they would take an exam over the study unit, they would not miss anything covered in lecture since they were provided with instructor-prepared written material covering thoroughly the content of those lectures. Thus, the essential difference between the WMO group and the LO group was that the former received the lecture material in a written form and the latter received it orally.

Lecture Plus Written (LPW).--The 13 students in the Lecture Plus Written (LPW) group received all of the material given to the WMO group but their instructions for the week included the statement that they were expected to attend the two lectures over the course material. Thus, students in this treatment condition received the supplemental material in both written and oral form.

Written Material Plus Proctor Assessment (WMPA).--The 13 students in this group received materials identical to those given to the WMO group; however, their instructions required that they report to a special classroom at the time the two lectures were being given for purposes of completing two quizzes over the study unit. The first of these two quizzes covered the first half of the study unit and the second quiz covered the

last half of the study unit. Neither of these quizzes contained test items which appeared on the final criterion test although the quizzes, of necessity, were over the same material.

Upon completing a quiz students reported to one of two volunteer undergraduate exam graders (proctors) who promptly scored each student's answers to the test items. Since the student was present while his quiz was being evaluated the proctor was able to ask for supplemental information if the student's answers were ambiguous. The proctor scored each answer for its correctness (satisfactory or unsatisfactory), and a student's quiz was considered acceptable only when he had successfully answered each question. Failure to perform acceptably on the quiz meant that the student was asked to recycle, i.e., to re-study the course material and report at a later time to demonstrate mastery of course material to the proctor. In the event a student failed to demonstrate mastery of a key concept after recycling through the course material a second time, he was tutored by the proctor until, in the proctor's judgment, he understood the concept involved.

Criterion Test.--After receiving a list of objectives from the course instructor, a graduate student teaching assistant thoroughly familiar with the course material generated a series of twenty test questions designed to assess the extent to which student performance matched the objectives set out by the instructor. The appropriateness of these questions, given the unit objectives, was confirmed by a senior faculty member in the Philosophy Department who had earlier used the same text material in teaching the same course. At no time did the regular course instructor see this examination until after it had been administered to his students.

To prevent possible grader bias each exam was numbered and students signed their name to a numbered card attached to each examination. These cards were then collected and were matched to examinations only after grading was completed. The exams were scored by both the teaching assistant and the instructor, and scoring discrepancies greater than 5% were resubmitted to the graders for re-evaluation. Only when grading discrepancies fell within this 5% range was an examination considered graded. For purposes of subsequent data analysis the average of these two scores was used as the grade earned by a student.

Results.--For practical reasons the authors felt it would be undesirable to attempt to randomly assign students to class sections for purposes of the present experiment. However, the class had been earlier subdivided into fourths in connection with testing procedures, and earlier test results had indicated these class sections were comparable in ability. As a further check on the similarity of these sections the cumulative grade point average (GPA) was obtained for each student at the time he registered for the class. The mean GPA for each section was as follows: $\bar{X}_{mpa} = 3.21$; $\bar{X}_{mo} = 3.12$; $\bar{X}_{lo} = 3.10$; $\bar{X}_{lpw} = 2.82$. In view of the fact that GPA correlated poorly with criterion test score ($r = 0.27$), there was no justification for attempting a statistical adjustment of the means of

the various sections.

Means and standard deviations of exam scores for each of the four class sections were prepared. These test scores were subjected to a one-way analysis of variance with the resulting $F_{3,49} = 4.63$, $p < .05$. Reliability of the differences between section means on the unit exam was subsequently evaluated with the Duncan Multiple Range Test, and the poorer mean performance of the WO section was found to be statistically reliable. None of the other mean differences were statistically significant.

Discussion.--The slight superiority of the WMPA group over the other three groups, although not statistically significant, except for the WO group, join a growing body of literature (Born, Gledhill, and Davis, 1972;* McMichael and Corey, 1969;** Sheppard and MacDermot, 1970***) suggesting that a test-interview procedure like that employed with the WMPA group is capable of generating examination performance equal to or superior to procedures such as the "lecture only." However, these earlier investigations have all been concerned with the teaching of psychology, and it seems likely that a course in informal logic is concerned with developing quite different skills than those usually developed in a first course in psychology. Therefore, it is of some interest that the WMPA section scored at least somewhat higher than all other sections. At the very least, it would appear that substituting short quizzes and an interview with an advanced undergraduate for the traditional lecture may be an equally efficient way to use scheduled class time.

In view of the fact that there was only a 20 point maximum on the criterion test and the mean of the WMPA group was 16.92, differences in the impact of these teaching procedures could have been masked by a "ceiling effect." On a percentage basis, the WMPA group mean was a full 5% higher than the mean of the next highest section (the LO group). Of considerable interest is the fact that WMO group performance was reliably inferior to the performance of all other class sections. The simplest explanation of these results would be that the written materials available

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*Born, D. G., Gledhill, S. M., and Davis, M. Examination performance and number of student withdrawals in lecture-discussion and personalized instruction courses. Journal of Applied Behavior Analysis, 1972, in press.

**McMichael, J. S., and Corey, J. R. Contingency management in an introductory psychology course produces better learning. Journal of Applied Behavior Analysis, 1969, 2, 79-83.

***Sheppard, W. C., and MacDermot, H. G. Design and evaluation of a programmed course in introductory psychology. Journal of Applied Behavior Analysis, 1970, 3, 5-11.

to these students did not include crucial information which became available during lectures and/or it was not well programmed.

A closer look at the individual scores on the criterion test suggests an alternative explanation. The four lowest scores in the class were all from the WMO section, and the highest of these four scores was three points lower than the next lowest score in the class. Since the superior performance of the WMPA group would seem to suggest the written materials were at least adequate for understanding of the material without lectures, such dismal performances could mean that these students had simply not studied carefully prior to taking the exam. For such students, a lecture system in which text related material is discussed in class could provide sufficient contact with the material for at least marginal learning; without lectures, the amount learned from insufficienct reading stands alone.

Study Systems Project

Study Systems is a program at the University of Utah offered to students who wish to improve their study skills and their overall academic performance. The 1971-72 Study Systems Project was directed by Ian Griggs, Center research associate. The Study Systems curriculum, as offered in the course General Education 197, focuses on study planning and scheduling, reading methods, test taking, writing, reciting, researching, and self-management techniques. The material is presented in an auto-instructional format that emphasizes behavioral "try-outs" and is supplemented with lectures, small group discussions, and individual counseling.

An integral part of the Study Systems program is the use of student counselors who monitor and assist students in completing the requirements of the program and in applying the Study Systems principles to other University courses. The counselors add an extra dimension to the program because they can provide support, give encouragement, react to personal problems, provide suggestions, and facilitate positive behavior change.

Based upon preliminary data for 1971-72, the program may be helpful in improving students' grade point averages. In addition, it appears to provide some encouraging side effects in terms of the counselors' grades. For example, counselors not only gain a great deal of satisfaction from the experience of assisting other students, but they also appear to gain personally by incorporating many of the Study Systems principles into their own study behavior, consequently improving their own grade point averages.

The Study Systems project is funded under the University's General Education Program, with additional funds for program development and evaluation provided by the Center. Autumn Quarter 1971 enrollment in

Study Systems was 184 students in four sections, Winter Quarter 1972 was 117 students in four sections, and Spring Quarter 1972 was 81 students in four sections. Of the total 1971-72 enrollment of 382, 37 students or 9.7% represented minority groups. Of these 37, 12 were Black, 24 were Chicano, and one was Indian. The remaining 345 students consisted generally of two types--first, those who were achieving adequately but who wished for some reason to raise their academic performance, and second, those who could be classified as academically "high risk" students. The latter group, of which minority students were often also a part, consisted of those students whose low admission test scores, erratic high school records, and race/class/cultural characteristics, taken together, place them at a disadvantage in competition with the majority of students at the University of Utah.

Briefly, the four major objectives of the 1971-72 Study Systems program were as follows:

(1) The first objective was to provide an increasingly effective study skills course for undergraduates classified as minority or academically high-risk students. The Autumn Quarter 1971 program resulted in a +.46 mean GPA increase over predicted GPA for the students enrolled. Data for Winter and Spring Quarters, 1972, are unavailable at the present time.

(2) Objective #2 was to develop, test, and implement new materials and techniques for teaching study skills. The Autumn Quarter 1971 program provided the data necessary for program revision. New systems, materials, and situational exercises that simulate classroom conditions were subsequently developed. It was hypothesized that the fidelity of the Study Systems program could be increased by utilizing a series of situational exercises as mediation devices. Conclusive data on the effectiveness of these techniques have not been obtained at this time.

The Autumn Quarter 1971 curriculum sequence included 13 packets with the followng titles: "Student Questionnaire," "Course Information," "PERT," "Task Calendar," "Rewarding Activities," "Study Contract," "Reading Behavior," "Test Taking Skills," "Study Tools," "Listening," "Writing Methods," "Library Skills," and "Final Examination."

Beginning Winter Quarter 1972, a new series of five instructional units was developed, each with a mastery test. The units focused on five of the chief topics featured in the Autumn Quarter packet system. An outline of the new Study Systems course sequence and content used during Winter and Spring Quarters 1972 is as follows:

Introduction to Study Systems
Study Skills Inventory (Pre-Test)
Study Skills Profile

Unit #1: Some Tools of the Trade
- A. Introduction to Study Systems
- B. Study Tips: Do You or Don't You?
- C. Unit Study Contract
- D. Course Information Form
- E. Unit Mastery Test
- F. Certificate of Completion

Unit #2: Study Planning
- A. Unit Study Contract
- B. Study Area
- C. Reading Rate Graph
- D. Study Rate Graph
- E. Why Plan?
- F. Task Calendar
- G. Reading Goals Sheet
- H. Rewarding Activities
- I. Unit Mastery Test
- J. Certificate of Completion

Unit #3: Reading Skills
- A. Unit Study Contract
- B. The Pop Search Method
- C. Underlining
- D. Notational Systems
- E. Speed Reading
- F. Unit Mastery Test
- G. Certificate of Completion

Unit #4: Test Taking Skills
- A. Unit Study Contract
- B. Pre-Exam Review Method
- C. Test Prediction
- D. Taking Tests
- E. Objective Exams
- F. Taking Essay Exams
- G. Unit Mastery Test
- H. Certificate of Completion

Unit #5: Writing, Reciting & Researching
- A. Unit Study Contract
- B. Note Taking
- C. Written Assignment Planning & Organization
- D. Presentation Methods
- E. Library Methods
- F. Unit Mastery Test
- G. Certificate of Completion

Testing and Evaluation

A. Comprehensive Examination
B. PASS (Situational Exercises)
C. Student Course Evaluation

(3) The third objective was to seek outside sources of funding to continue the Study Systems program. A proposal titled "An Investigation of Three College Level Study Skills Methods" was submitted to the U. S. Office of Education's Regional Research Program. The major aim of the proposal was to isolate and test undividual study habits as to their effectiveness in improving the study behavior of high-risk college freshmen. Financial support was denied based on the fact that a significantly larger number of proposals was submitted under the Regional Research Program than could be supported by that agency.

(4) The final objective was to provide an opportunity for interested upper division and graduate students to receive academic credit for their participation in the program as staff members. Approximately 35 such students were used in the program during 1971-72. In general, academic credit was handled by allowing upper division undergraduates or graduate students to enroll for three hours of independent study credit, usually in General Education, Psychology, or Educational Psychology. These individuals were then assigned to a teaching fellow who supervised their work throughout the quarter. This work consisted of monitoring behavioral tryouts, counseling students in the area of study skills, evaluating student performance levels in various academic exercises, and engaging in curriculum development. Students working under these conditions in independent study were typically placed under some form of contract, and grades were assigned based on their meeting the terms of the contract.

PART IV

MAJOR DISSEMINATION EFFORTS (EPR)

The periodical Educational Progress Reports (EPR), Issue No. 6 through the present Issue No. 15, has been the major dissemination arm of the Center during 1971-72. A continuing effort has been made to evaluate the effectiveness and re-define the function of EPR during the current year. Brief comments regarding the form and content of EPR during last year are necessary in order to illustrate both this process and the resulting changes in the 1971-72 EPR issues.

During its first year, EPR was issued periodically a total of five times and carried items concerning University of Utah instructional development projects, as well as information of a more general nature related to improving learning opportunities at the higher education level. Issues 1 through 4 contained general news of Center and other projects and activities, while Issue 5 was devoted solely to the results of a Center-conducted survey of exemplary instructional practices on campus. Expenses for the first five issues were relatively modest--an average of 21¢ per copy for printing and mailing to an on-campus and off-campus mailing list of approximately 3,000. Included on the mailing list were the following categories of recipients: all University of Utah faculty members and teaching fellows; department heads, deans, and administrators at all other colleges and universities in Utah; members and professional staff of the Utah State Board of Higher Education; members and professional staff of the Utah State Department of Public Instruction; Utah school superintendents and principals at both public and private institutions; staff members at other university and regional centers for the study of higher education; and miscellaneous requests.

Evaluation of EPR was conducted in three phases. The May 1971 issue contained a "tear-out" reader response questionnaire. Out of 3,000 questionnaires, the response was meager (N=68). However, 40 of the respondents listed specific things they did as a result of reading EPR, including the following:

"Attempted to introduce innovations into my teaching."
"Prepared joint proposal with Yugoslav scientists."
"Worked out program on individualized teaching."
"Notified interested faculty."

Most of the general responses were positive, including the following:

"No changes in publication needed."
"Excellent report."
"It serves a broad public well at present."
"Excellent insight into current teaching methods."
"Splendid article on . . ."

Negative comments included concern for supposed high publication costs, the "commercial" look, a wish for information in greater depth, and a conflicting wish that the publication be less scholarly. Thus, the results of the May survey were largely positive but represented only a small percentage of the mailing list.

In an attempt to get greater response, a return-card questionnaire seeking essentially the same types of information was mailed in December 1971 to 550 names off-campus, including administrators at Utah colleges, and the Utah State Boards of Education and Higher Education. A 20% response requested continuation of receipt of EPR and many also made positive comments of the type cited above.

A telephone survey of 71 randomly selected names (out of 2,700, including University of Utah faculty and teaching fellows, and Utah school principals) was conducted at the same time as the return-card survey. Questions identical to those on the return-card were asked. Thirteen of the group requested minor changes (supposed costs were again a concern) and eleven reported having done something positive as a result of reading EPR, such as the following:

"Received research grant based on information in EPR."
"Set up a training program."

In summary, the readership was generally silent (unless directly approached), strongly positive in the majority of those responding, and decidedly hostile in a few cases (primarily with respect to finances) toward the Center and its publications.

In light of this data, the Center staff decided during 1971-72 to change EPR to an occasional publication (as needed), to confine general news of project activities to one issue at the close of the 1971-72 year to be designated as an "annual report," to use other issues to disseminate actual products or models developed as a result of Center projects, to increase informal communication via memos to specific groups, and to develop sub-groupings within the total mailing list for each mailing instead of routinely mailing all issues of EPR to the entire list.

Accordingly, EPR Nos. 6-14 were prepared at the close of two major projects of the Center in June 1972, and were released simultaneously at the beginning of Autumn Quarter 1972. Because of the nature of these issues (developmental products rather than general news of projects), and

the relative expense of reproducing the material (41¢ per copy), copies were sent only to 1971-72 Center Advisory Board members, and to Deans, Department Chairmen, and General Officers of the University, rather than to all faculty members and teaching fellows as previously. A limited number of additional copies of these issues were made available on a request basis to other University faculty members. It should be noted that although EPR per-copy costs were higher during 1971-72 than the preceding year, this increase was largely a factor of their increased length, as less expensive (and less attractive) production arrangements were developed for Nos. 6-14 than were utilized the preceding year.

As indicated above, Issues 6-14, all of which were "teaching proficiency tests," resulted from one of the primary areas of work of the Center during 1971-72. This effort involved two closely related projects--the "Teaching Fellows Project" funded by the Institutional Funds Committee, and the project "Instructional Technology and Diverse Methods of Instruction" funded by the Danforth Foundation (please see Part III of this report for greater detail concerning these projects). Generally speaking, in both projects, the teaching proficiency test was developed and used as the vehicle for working with professors and teaching fellows in examining, evaluating, and altering selected aspects of the instructional-learning process at the university level. The foreword to each of Issues 6-14 of EPR sets forth some of the purposes, limitations, and potential uses of the teaching proficiency test.

The 1971-72 Center publication year closes with the current issue of EPR, the annual report. This issue, prepared in the same less expensive format as Nos. 6-14, is being disseminated to the entire mailing list of 3,000, with the exception of Utah school principals. It is anticipated that the future issues of EPR, as in the past, will reflect expressed reactions from the readership, as well as the Center's total budgetary restrictions, staffing levels, and product development levels.

All EPR issues and other miscellaneous publications of the Center are available on an order basis to those off-campus persons or agencies not on the Center mailing list. The complete Center publications price list together with Bureau of Educational Research publications has been reprinted as the following four pages of this report.

publications list

CENTER TO IMPROVE LEARNING & INSTRUCTION
and
BUREAU OF EDUCATIONAL RESEARCH

308w Milton Bennion Hall
University of Utah
Salt Lake City, Utah 84112

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Please record the number of copies of each item you wish to order, indicate the appropriate amount, and return this order form with your payment to the above address.

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Address _____

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	Cost Per Item:	No:	Sub-Total:
PERIODICALS			
1. educational progress reports, 1970-71			
Issue #1 (general issue)	$ .30	____	____
Issue #2 (general issue)	.30	____	____
Issue #3 (general issue)	.30	____	____
Issue #4 (general issue)	.30	____	____
Issue #5, "Survey of Exemplary Instructional Practices"	.30	____	____
2. educational progress reports, 1971-72			
Issue #6, A Teaching Proficiency Test in English Literature: "Identifying Themes and Poetic Devices in Selected Poems"	.75	____	____

	Cost Per Item:	No:	Sub-Total:
2. educational progress reports, 1971-72 (continued)			
Issue #7, A Teaching Proficiency Test in English: "Identifying and Using Four Types of Speaking and Writing"	$ .75	____	____
Issue #8, A Teaching Proficiency Test in physics: "The Analysis of Errors"	.75	____	____
Issue #9, A Teaching Proficiency Test in Spanish: "Conjugating and Using Future Terse Verbs in Spanish"	.75	____	____
Issue #10, A Teaching Proficiency Test in mathematics: "Using an Expedient Method of Multiplication"	.75	____	____
Issue #11, A Teaching Proficiency Test in philosophy: "Analyzing a Philosophical Argument"	.75	____	____
Issue #12, A Teaching Proficiency Test in physics: "Elementary Model of Some Electric and Magnetic Properties of Matter"	.75	____	____
Issue #13, A Teaching Proficiency Test in Spanish: "Identifying and Using the Present Subjunctive in Spanish"	.75	____	____
Issue #14, A Teaching Proficiency Test in music: "Understanding and Accepting One's Own Responses to Music in Terms of Psychic Distance"	.75	____	____
(The complete set of 1971-72 Teaching Proficiency Tests comprising Issues 6 through 14 is available at the special price of $4.95 per set.)	4.95	____	____
Issue #15, "Annual Report of the Center to Improve Learning and Instruction, 1971-72"	.75	____	____

MONOGRAPHS

1. Behavior Systems Corporation and Auerbach Corporation. Design Manual for Proposed Alternative Rehabilitation System for the Fred C. Nelles School for Boys. Salt Lake City, Utah: Behavior Systems Corporation, undated. 57 pp.	2.00	____	____
2. Behavior Systems Corporation. The Grant Dormitory Behavior Modification Program: Nevada Youth Training Center, Elko, Nevada. Salt Lake City, Utah: Behavior Systems Corporation, 1969. 100 pp.	3.00	____	____

	Cost Per Item:	No:	Sub-Total:
Monographs (continued)			
3. Bureau of Educational Research. Expanding the Educational Alternatives for Children: A Report on the Tri-University Project in Elementary Education, 1967-70. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1971. 58 pp.	$2.00	____	____
4. Center to Improve Learning & Instruction. Instructional Technology and Diverse Methods of Instruction: Final Report, Danforth Challenge Grant Project. Salt Lake City, Utah: Center to Improve Learning & Instruction, University of Utah, 1972. 299 pp.	8.00	____	____
5. Center to Improve Learning & Instruction. Sources of Financial Support for Research and Study. Salt Lake City, Utah: Center to Improve Learning & Instruction, University of Utah, 1972. 55 pp.	2.00	____	____
6. Della-Piana, G. M., and Faye S. Ellison. Counselor Response Categories: Research and Development on a Learning Program. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, undated. 106 pp.	3.00	____	____
7. Della-Piana, Gabriel M. Course Model: Chapter 3. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1971. 60 pp.	2.00	____	____
8. Della-Piana, Gabriel M. The Development of a Model for the Systematic Teaching of the Writing of Poetry. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1971. 163 pp.	4.00	____	____
9. Della-Piana, Gabriel M. The Evaluation of Early Childhood Programs: Strategy, Technique, and Case Histories. Salt Lake City, Utah: Privately printed, 1972. 115 pp.	3.00	____	____
10. Della-Piana, Gabriel, Robert F. Stahmann, and John E. Allen. The Influence of Parental Attitudes and Child-Parent Interaction Upon Remedial Reading Progress. Salt Lake City, Utah: University of Utah, 1966. 61 pp.	2.00	____	____
11. Della-Piana, Gabriel M. Writing Poetry: A Self-Instructional Approach (Developmental Edition). Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1971. 54 pp.	2.00	____	____

	Cost Per Item:	No:	Sub-Total:
Monographs (continued)			
12. Griggs, Ian, Bruce Meyer, and Everett Murdock. The Game Plan. Salt Lake City, Utah: Privately printed, undated. 173 pp.	$4.00	____	____
13. Jackson, Donald A., William J. Mayville, and Joseph B. Cowart, Jr. The Auto-Pedestrian Safety Project. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1971. 73 pp.	2.00	____	____
14. Jackson, Donald A., William J. Mayville, and Joseph B. Cowart, Jr. Setting Up an Effective Pedestrian Safety Program for Elementary Schools. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1971. 44 pp.	2.00	____	____
15. Jackson, Donald A., Gabriel M. Della-Piana, and Howard N. Sloane, Jr. Establishing a Behavior Observation System: A Self-Instructional Program. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1971. 50 pp.	2.00	____	____
16. Meux, Milton, Keith Evans, George Endo, and Michael Hogben. Evaluative Teaching Strategies in the Social Studies. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1967. 95 pp.	3.00	____	____
17. Meux, Milton, Keith Evans, and Terry P. Applegate. The Development of a Value Observation System for Group Discussion in Decision Making. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1972. 79 pp.	2.00	____	____
18. Sloane, Howard N., Jr. Classroom Management. Salt Lake City, Utah: Privately printed, 1972. 190 pp.	4.00	____	____
19. Woodruff, Asahel D., Philip G. Kapfer, et al. The Life-Involvement Model of Education (LIM): A Systematic Description in Expanded Outline Form. Salt Lake City, Utah: Bureau of Educational Research, University of Utah, 1972. 80 pp.	2.00	____	____
TOTAL			____
Postage and handling (15% of TOTAL)			____
GRAND TOTAL			____

PART V

PROPOSAL DEVELOPMENT ACTIVITY

The principal direction taken by Center staff members during the current year in attempting to secure outside funding for Center projects has been the development of a contingency contracting model. Project proposals submitted by the Center during the year illustrate several possible variations on such a model.

A Center proposal based on a two-stage contingent funding arrangement to pay University faculty members during a one-year period for developing "instructional alternatives" was prepared for submission in the Educational Incentive Awards category of the General Electric Foundation. A similar proposal, but in three stages covering a projected 18 months of funded activity, was developed and submitted to the Esso Education Foundation under its program of Educational Research and Development. The latter proposal was also presented to personnel in the U.S. Office of Education Research Division. Although support was declined after lengthy deliberations by both General Electric and Esso, the reaction at the U.S. Office of Education was positive, and the proposal is now being re-written to meet new project proposal guidelines. Also, the Danforth Foundation is looking at a presubmission draft of a similar proposal.

In general, the Center proposals seek to approach the related problems of (1) the lack of enough clearly specified alternatives for students in the newly available University Studies Degree, (2) the lack of significant measures of student performance in the newly developing programs, and (3) the lack of a broad enough base of contingent funding for increments of faculty progress toward broad University goals (including interdisciplinary programs, self-study programs, socially relevant alternate paths, increased educational accountability, and provision for consultative assistance and experimentation on innovations).

The method outlined in the Center proposals for getting at these problems is the implementation of a multi-stage program of instructional development awards. The key elements of that program would include (1) building on previous work of the faculty and (2) providing for contingent funding of increments of progress in planning and implementing programs related to the goals specified above. Promising personnel and programs would be selected on the basis of previous performance. The Three-Stage

Award System, for example, would allow identification of a large number (perhaps ten) of promising developments based on past performance and quality of current design. It would then permit provision of training and consultation for further development of the most productive of these (about six). Finally, it would support three of the best of the six for the final stage of development and installation funding. Center surveys of developments on the Utah campus have provided ample evidence that there would be a significant number of worthy project proposals.

Criteria for awards at all stages would be clearly specified to provide maximum flexibility and creativity in design within the major goals of the programs. Contingent funding at each stage would increase the probability of getting successful performance. Stage Three would include the requirement of planning for incorporating project developments within the regular budget and program of the University. At Stages Two and Three, consultative aid by Center staff members and outside specialists would be provided. The assistance would involve workshops and continuing individual consultation. Such technical assistance in the area of measurement and program design, for example, would insure continuous developmental evaluation and final program evaluation.

PART VI

CONSULTATIVE ASSISTANCE TO DEPARTMENTS FOR PROPOSAL WRITING

Assistance in varying amounts was provided to a number of departments on campus during 1971-72 in the preparation of project proposals for outside funding. These included proposals in modern dance, microbiology, and pharmacy.

Modern Dance

A multidisciplinary team of University faculty members was involved in the initial planning for a proposed project, "Multidisciplines of Modern Dance." The actual proposal, which subsequently underwent several revisions, was written by the Center director. The proposal involved a year-long workshop designed to generate examples of the contributions of musicians, artists, drama directors, filmmakers, etc., in the multidisciplinary training of choreographers and dance performers to improve their creativity and relevance to contemporary life without sacrificing artistic integrity. Subordinate objectives included providing low-cost alternatives to the multidisciplinary workshop approach, and designing and trying out techniques for getting larger audiences and greater audience participation and communication at dance performances.

A draft of the proposal was submitted for reactions to personnel in the National Endowment for the Arts and the U.S. Office of Education. Although there was considerable interest in the project, it was found, because of its breadth, not to be fundable in its draft form. This proposal and a series of others are currently being rewritten by Joan Woodbury, Shirlie Kirle, and others in Modern Dance with consultative assistance from Dr. Della-Piana.

Microbiology

The Center director assisted with the preparation of a training grant proposal, "Microbiology-Allied Health Professions' Training Program." The proposal was approved and funded in June 1972. Dr. Lowell A. Glasgow, Chairman of the Department of Microbiology, is serving as director of the five-year project. The primary objective of the project is to develop a new coordinated program to train individuals with the potential for careers

(1) as educators in Allied Health Science (Medical Technology) teaching programs, (2) as directors of clinical diagnostic microbiology laboratories, and (3) in agencies concerned with public health at the county, state, or national level. Specifically, the program would make possible the opportunity for medical technologists to obtain advanced training in preparation for positions of greater responsibility in laboratory supervision and medical technology training.

In achieving these goals, the staff of the Center is providing close supportive services in educational training for the medical technology program. Specifically, the Center is assisting the teaching assistants in the program to (1) develop skills in the analysis of student performance problems, (2) develop skills in designing instructional, management, and selection solutions to student performance problems, and (3) develop skills in evaluating and validating the effectiveness and efficiency of the solutions. The requirements for consultant services are minimal at the beginning of the project, and will increase annually until a plateau is reached during the fourth year of the project. Center staff members are donating services to the project, and some student assistance is being funded under the grant.

Pharmacy

The Center staff prepared the teaching skills training component of a proposal submitted by the College of Pharmacy for a five-year grant for training and traineeships for health professions teaching personnel. Although not approved because the proposal exceeded the criteria for the particular legislation under which funding was sought, the proposal was designed to initiate an important and unique change in the education of pharmacists. It was planned to involve the pharmacy practitioner in the teaching of pharmacy students during the university course work phase of their training. In most existing programs, the practical training of prospective pharmacists is left almost entirely to the discretion of individual pharmacists with whom students are placed for the internship phase of their training. This is not an altogether satisfactory arrangement because such on-the-job training varies from pharmacy to pharmacy, a genuine student-teacher relationship is not usually established, the training does not typically reflect recent trends in either pharmacy education or practice, it is not usually in tune with what is being taught in colleges of pharmacy, and it usually does not include in-depth study or understanding of the many functions performed in the real-world pharmacy setting. Hence, the broad objective of the proposal was to change the behavior of the trainee in pharmacy practice in ways that have not typically resulted from current patterns in pharmacy training. Such an objective remains valid, assuming that appropriate sources of funding can be found for the proposal.

Nursing

The College of Nursing has been conducting a series of continuing education activities, partly with outside funding. Dr. Della-Piana provided assistance to this group in site visit review and in developing project evaluation strategies and procedures. During 1972-73, when he will be on sabbatical, he will donate time to College of Nursing projects without financial reimbursement in order to maintain contact with the programs. In addition, some student assistance might be funded by the College of Nursing and the program grants.

PART VII

CLEARINGHOUSE FUNCTIONS

As indicated in Part I of this report, one of the goals of the Center has been to serve as a kind of "clearinghouse" for information and services related to the improvement of teaching and learning on campus. The extent to which an administrative unit can function successfully as a clearinghouse depends on a variety of factors, one of the most basic of which is that possible users must be aware of the service and its benefits. In an effort to make the Center's clearinghouse function visible and to illustrate its uses, a number of items have been prepared and disseminated to several different faculty and administrative groupings during the 1971-72 year. These include the following:

(1) Guide to Office of Education Programs in Higher Education, Fiscal Year 1972, sent to deans and department heads in the Graduate School of Education, November 1971.

(2) Comprehensive Guide to Office of Education Administered Programs, Fiscal Year 1972, sent to deans and department heads in the Graduate School of Education, December 1971.

(3) Research on Improving University Teaching: Bibliography and Reprinted Material, sent to all University teaching fellows, January 1972.

(4) Two-Part Course Evaluation Form, sent to all University faculty members, February 1972.

Other clearinghouse-type activities include those that are both more formal and less formal in nature than the items listed above. On the more formal side is the series of publications, Educational Progress Reports, issued periodically by the Center. These publications are discussed primarily in Part IV of this report. Also on the more formal side are the reports of major projects conducted by Center staff members, discussed at length in Part III of this report.

Included in the informal clearinghouse functions performed by Center staff members during 1971-72 are the numerous consultation services requested by and provided to other University units and individuals. These have included preparing written reactions to innovative curricular ideas on campus,

providing information and feedback on a performance-based design for professional certification, developing listings of possible sources of funding at the request of individual faculty members wishing to fund and pursue research on specific topics, assisting with the design of departmental evaluation systems, and providing information or suggesting sources of information on specific topics. In addition, Center staff members have participated in the preparation of one of the Provost's Task Force Reports (Task Force on Reward Systems), evaluation instruments for Student Advisory Committees, the Freshman Year Program, and the informal training of faculty in instructional systems design (e.g., Kline Strong in the College of Law and Carl Durney in the Electrical Engineering Department). Strong, for example, has subsequently applied instructional systems design to problems of law instruction and service in ways that are gaining considerable attention and achieving significant efficiencies. Consultative assistance with proposal writing was discussed as a separate topic in Part VI of this report.

PART VIII

WORKSHOPS

The Center has organized, sponsored, or conducted a number of workshops on campus throughout the 1971-72 year on topics having considerable general interest for the University faculty.

Workshop on Effective Use of Examinations

A one-day workshop on the use of examinations in teaching and learning was sponsored by the Center on July 31, 1971. Lawrence M. Aleamoni and James L. Wardrop of the Measurement and Research Division, Office of Instructional Resources, University of Illinois, served as workshop leaders. Topics of discussion included the relationship of tests to instructional content, norm-referenced vs. criterion-referenced tests, techniques of writing good test items, test scoring and analysis, and grading. Those attending represented a substantial number of the departments on campus.

TF Invitational Workshop

On November 20, 1971, an invitational workshop for University teaching fellows was conducted by Center staff members. The workshop featured the three topics of teaching proficiency assessment, personalized systems of instruction, and test construction. The strategy for the workshop departed from previous TF training efforts in that it was used (1) as a terminal workshop for those who prefer to work at improving their teaching skills on their own (and thus materials on each of the three topics were distributed to participants), and (2) as an orientation and selection workshop for those who wished to be involved at one or more levels in continuing workshops and consultation with Center staff members throughout the year. Although attendance by TFs at the Saturday workshop was not required by all departments, more than 100 TFs did attend. Of these, 42 elected to use on their own the workshop materials provided, 37 indicated a wish to try out the materials independently and obtain Center assistance as needed, and 27 requested participation in the Center's program of continuing consultation in the three designated areas throughout the year. Nearly 90% of those attending rated the total workshop at "4" or "5" on a five-point scale, ranging from "really poor" (rating of 1) to "great" (rating of 5).

Further details about the workshop and the Center activities that resulted from it are presented under "Teaching Fellows Project" in Part III of this report.

Clinical Education Workshop for Physical Therapy

On February 11, 1972, Dr. Miriam Kapfer organized and presented a workshop on behavioral objectives for clinical education to the off-campus and out-of-state clinical education supervisors associated with the University's Physical Therapy Program. Topics covered in the workshop included the implications of the behavioral approach for teaching and clinical education, techniques of objective writing, and the development of behavioral objectives appropriate for clinical programs in physical therapy.

Approximately 55% of those attending responded to a follow-up assessment of the workshop which was mailed to them during the week following the workshop. The results of the questionnaire revealed no blanket negative responses, although two participants would have preferred greater time during the workshop for skill development in objective writing. All other reponses were positive, including comments that characterized the workshop as "helpful," "interesting," "well prepared," "well organized and informative," and "exactly what was needed."

Teaching Proficiency Assessment Workshops

A series of three workshops on techniques of assessing teaching proficiency was conducted during February 1972. These workshops were an integral part of the teaching proficiency phase of the Teaching Fellows Project, and therefore are discussed in greater detail in Part III of this report.

PART IX

CENTER STAFF PUBLICATIONS AND PAPERS

The following publications by Center staff members have appeared during the 1971-72 year. None of the items listed below is duplicated on the list of Center/Bureau publications included as a section of Part IV of this report. In the case of the articles listed below, reprints may be obtained by writing to the individual authors directly.

(1) Born, David G. "Student Withdrawals in Personalized Instruction Courses and in Lecture Courses." Read at Rocky Mountain Psychological Association, 1971.

(2) Born, David G., M. L. Davis, and S. M. Gledhill. "Exam Performance and Withdrawals in Personalized and Lecture Courses." Read at Western Psychological Association, 1971.

(3) Born, David G., and Emily W. Herbert. "A Further Study of Personalized Instruction for Students in Large University Classes," Journal of Experimental Education, XL (Fall, 1971), 6-11.

(4) Born, David G., Stephen M. Gledhill, and Michael L. Davis. "Examination Performance in Lecture-Discussion and Personalized Instruction Courses." Journal of Applied Behavior Analysis, V (Spring, 1972), 33-43.

(5) Born, David G. "Personalized Instruction: A Solution to the Problem of Large Classes?" PSI Newsletter, (No. 3, 1972).

(6) Della-Piana, Gabriel M., Michael Hogben, and Daniel R. Anderson. "Program Improvement by Systematic Comparison." In Robert A. Weisgerber (ed.), Perspectives in Individualized Learning. Itasca, Illinois: F. E. Peacock Publishers, Inc., 1971, pp. 210-216.

(7) Della-Piana, Gabriel M. "Strategy and Technique in the Evaluation of Instructional Programs." Presented at the Annual Convention of the International Reading Association, Atlantic City, New Jersey, 1971.

(8) Della-Piana, Gabriel M., and Julie Ralph. Educational Psychology USAFI Study Guide A491.1. Madison, Wisconsin: U. S. Armed Forces Institute, 1971.

(9) Hively, W. (chairman), D. Bushell, Jr., B. L. Hopkins, H. N. Sloane, and R. Ulrich (participants). "What Next?" A symposium in E. A. Ramp and B. L. Hopkins (eds.), A New Direction for Education: Behavior Analysis 1971. Lawrence, Kansas: Department of Human Development, University of Kansas, 1971.

(10) Kapfer, Miriam B. Behavioral Objectives in Curriculum Development: Selected Readings and Bibliography. Englewood Cliffs, New Jersey: Educational Technology Publications, Inc., 1971. 400 pp.

(11) Kapfer, Miriam B. "Behavioral Objectives in Music Education," Educational Technology, XI (August, 1971), 30-33.

Also published in:

Audio Tape Cassette Series B. Englewood Cliffs, New Jersey: Educational Technology Publications, Inc., 1972.

(12) Kapfer, Philip G., and Miriam B. Kapfer, "Differentiated Staffing for Program Development: An In-Depth Look at an Incentive Model," Educational Technology, XII (June, 1972), 9-13.

(13) Rand, G. V., H. N. Sloane, and W. R. Dobson. "Some Variables Affecting Conditioned Suppression in Humans," Behavior Therapy, II (October, 1971), 554-559.

(14) Sesney, John Wilton. "The Development of Teaching Proficiency Tests at the University Level." Unpublished Ph.D. dissertation, University of Utah, Salt Lake City, 1972, 243 pp.

(15) Sesney, John W. "Summary of a Survey to Determine the Extent of Educational Goals and Objectives Among the States and Territories." Salt Lake City, Utah: Interstate Educational Resource Service Center, 1971, 51 pp.

(16) Sloane, H. N., and John E. Allen. "An In-Service Teacher Training Program in Contingency Management." In W. C. Becker (ed.), An Empirical Basis for Change in Education. Chicago, Illinois: S.R.A., 1971.

(17) Sloane, H. N. "Some Questions and Answers." A short note in W. C. Becker (ed.), An Empirical Basis for Change in Education. Chicago, Illinois: S.R.A., 1971.

(18) Sloane, H. N. (contributor). Educational Psychology: A Contemporary View. Del Mar, California: C.R.M., 1972.